

REMARKS

Restriction Requirement

The Examiner has required restriction to one of the following groups of Claims:

Group I: Claims 1-39, drawn to a method of making graded core/shell semiconductor nanorods; and

Group II: Claims 40-65, drawn to graded core/shell semiconductor nanorods;

Applicant hereby elects, without traverse, to proceed with examination on the merits of Group II, Claims 40-65. Claims 1-39 are hereby withdrawn as being drawn to a non-elected invention. Applicant reserves the right to pursue examination of the withdrawn claims in a divisional application.

Rejections under 35 U.S.C. §102

The Examiner has rejected Claims 40-65 under 35 U.S.C. §102(e) as being anticipated by Bawendi '829 (U.S. Patent No. 6,607,829) and under 35 U.S.C. §102(b) as being anticipated by Bawendi '901 (U.S. Patent No. 6,322,901).

Independent Claim 40 recites a graded core/shell semiconductor nanorod comprising at least a first segment comprising a core comprising a Group II-VI, Group III-V or a Group IV semiconductor, a graded shell overlying the core, wherein the graded shell comprises at least two monolayers, wherein the at least two monolayers each independently comprise a Group II-VI, Group III-V or a Group IV semiconductor.

Bawendi '829 taught nanocrystallites overcoated with a coating of a semiconductor material (col 6, lines 35-50). Bawendi gave examples for the overcoated nanocrystallites as (CdTe)ZnS and (CdTe)ZnSe, that is for nanocrystallites of CdTe having *an* overcoating of either ZnS or ZnSe. In Bawendi's Claim 40, he recited a nanocrystalline core and *an* overcoating of a semiconductor material on a surface of the core.

Bawendi '901 taught a coated nanocrystal with a core of CdS, CsSe, or CdTe and an overcoating of ZnS or ZnSe (abstract). Bawendi further taught, "...it will be readily apparent that the method of preparation may be used to obtain monodisperse overcoated quantum dots with various combinations of nanocrystallite core and overcoating.... It is contemplated that a variety of cadmium chalcogenides, for example, CdX, where X=S, Se, Te may be prepared and overcoated according to the method of the invention. It is further contemplated that the overcoating may be varied and may include, by way of example only, ZnS, ZnSe, CdS and mixtures thereof." (col 8,

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lines 45-58) Bawendi also taught that (CdSe)ZnS composite particles could also be passivated with TOPO/TOP (tri-n-octyl phosphine oxide/tri-n-octyl phosphine) on their outermost surfaces. (col 6, lines 59-61) As is well known, neither TOPO nor TOP is a Group II-VI, Group III-V or a Group IV semiconductor, as recited by the instant claim.

Bawendi neither taught nor suggested a *graded* shell overlying a core nor did he teach or suggest at least *two* monolayers *each independently comprising a semiconductor*, as recited by the instant claim. Thus in neither reference did Bawendi teach each and every limitation of independent Claim 40 and so failed to anticipate the claim.

Independent Claim 51 recites a nanorod barcode, comprising a first segment of a first material and a second segment of a second material joined longitudinally to the first segment, wherein at least one of the first and second segments is capable of generating emission in response to excitation energy.

Applicants cannot find in the Bawendi references any teaching of materials joined together in any fashion. After careful examination of the Bawendi references, applicants have found teachings only about monodisperse nanocrystallites, particles, or quantum dots. Bawendi neither taught nor suggested longitudinal joining, as recited by instant Claim 51. In fact, Bawendi taught only nanostructures approximately equiaxed – particles, dots. Furthermore, the concept of joining such structures *longitudinally* has no meaning.

Independent Claim 65 recites a method of using a nanorod barcode to identify an element, comprising labeling at least one identifiable element with at least one nanorod barcode as claimed in claim 51.

As Bawendi did not teach the nanorod barcode recited in Claim 51, he surely did not teach a method of using same.

Applicants respectfully traverse the rejections and submit that the Bawendi references failed to teach each and every feature of independent Claims 40, 51, and 65. Therefore, the pending claims are patentably distinct from the teachings of Bawendi.

Dependent Claims 41-50 and 52-64 each depend from one of these independent claims and therefore include all the features and limitations thereof. Furthermore, the dependent claims add further distinguishing features of particular utility. Accordingly, Applicants submit that the dependent claims are also allowable over the Bawendi references.

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CONCLUSIONS

In view of the foregoing remarks, Applicants submit that the application is in condition for allowance. If, however, some issue remains which the Examiner feels may be addressed by Examiner's amendment, the Examiner is cordially invited to call the undersigned for authorization.

Please charge any additional fees, including fees for additional extensions of time, or credit overpayment to Deposit Account No. 12 0690.

Respectfully submitted,
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